

## Key Concepts of Sustainability

### What is sustainability?

- Sustainability first emerged as an explicit social, environmental, and economic ideal in the late 1970s and 1980s.
- It began with the Agricultural and Scientific Revolution.
- The word is very fashionable and has increased in use since the first decade of the 21st century.
- Sustainability has multiple definitions, also known as a 'weasel word,' a word used to impress an audience without the actual knowledge of the word.
- Brundtland Report defines 'sustainable development' not 'sustainability.'
- "Sustainability is the need for humanity to live equitably within the means of nature" (Wackernagel & Rees, 1996)
- "Sustainability means to integrate our social and economic lives into the environment a moral imperative to meet the needs of future generations." (Ewoldt 2007 in Bartels, 2012)
- Environment- maintain and enhance the health of all living systems.
- Economics- in order for systems to continue over the long term, resources must be distributed fairly, with each individual able to meet their own basic needs. Unlimited economic growth is not sustainable.
- Equity- refers to equal access to food and healthy living, along with water, education, employment, and healthcare. It entails providing opportunities for all people, not just a privileged few. Equity also acknowledges that the decisions we make today will impact our future generations.
- People and nature are integrated, and therefore, people should be considered part of the environment also.
- Sustainability- abiotic and biotic elements
- The Three Pillars of Sustainability- promoting social justice, economic well-being, and environmental quality at the same time. Full-filling three goals simultaneously satisfy what is known as a triple bottom line.
- Issues such as poverty, unemployment, and inequality create tensions between these three pillars; therefore, tradeoffs are needed to solve them.
- 'Nested' diagram model (strong sustainability) critiqued that since the economy is in the middle, it makes people aim for the economy.
- Fourth Pillar of sustainability? education or culture
- Experts identified underlying causes of sustainability: population growth, poverty, affluence, natural capital, different worldviews, increasing isolation from nature (urbanization, technology).
- The biggest problem is how to make the solutions to these problems socially, economically, and politically acceptable.

### Why is sustainability important?

- " We cannot solve today's problems at the same level at which they are created" Einstein
- A sustainable future requires a shift towards a systems perspective with an emphasis on interdisciplinary understanding, collaboration, and co-operation.
- We need to take personal responsibility.
- Ethical Extensionism- is an argument in environmental ethics that moral standing ought to be extended to things that traditionally are not thought of as having moral standing. (animals, plants)
- Thus we should:

1. Rethink basic assumptions
2. Consider creative solutions
3. Advocate new ways to think or act
4. Balance challenges with realistic optimism
5. Do more with less

## Systems

- A set of interrelated things that affect each other.
- We live and work in systems. If we understand how systems work, we can influence them.
- In living systems, energy is continuously being transferred, and the matter is continually being moved around.
- Biomimicry- learning from nature. Ex-Japan bullet train design mimicked from Kingfisher beak.
- Gaia Theory- refers to the concept of the planet as a self-regulating system first developed by James Lovelock. Ex- Our Sun gets hotter as it ages, the average surface temperature on Earth has never varied by more than a few degrees.

## Ecosystems, goods, and services

- Nature provides us with goods we rely on ex- water
- We exploit the environment because no economic value is attached to them. Ex- free car analogy.
- Natural cycles are sustainable, and cyclic vs. linear systems create waste and are unsustainable.

## Economic system

- Economies rely on the environment for resources and to dispose of waste.
- Economic growth- is an increase in the number of goods and services produced by an economy over time.
- High throughput economies- highly productive but produces more waste.
- Economic growth maintains social order- perception/ opportunity to make more money or do better.
- Limits to growth: neoclassical economists- alternatives are there for resources, unlimited growth. Ecological economist- scarce resources.
- Steady State Economy- An economy that mimics natural ecological systems. This includes recycling used resources. It would have zero economic growth.
- We need to turn a high waste economy into a low waste economy.
- Re-localisation- using local resources Ex- community gardens or farmer's market.
- By not including 'External Costs,' goods and services appear cheaper than they are. Benefits- less transportation, less packaging = less pollution.
- Natural Capital is a way to estimate the value of the goods and services provided by nature. It is not measured in economics. Ex- the farmer has two fields. One is a ranch with cattle he can milk the cows or sell the milk. Moreover, the other is trees. If he was in financial need, he could cut down the trees and sell them and then use that space for more cows. What if the trees had value, and he was paid not to cut them?
- Internal Costs- an assumption that individuals directly involved in the transaction bear all the costs and benefits associated with an exchange of goods and services.
- External costs- the social, environmental and economic

## Equity

- Values and ethics influence our decisions
- Is population growth a problem? It is the way we live rather than the number of people alive.
- Japan's aging population – one solution is immigration. Reducing fertility rates to 1.4 to reduce overpopulation, therefore, is not always the answer.

## Consumption

- Illusions of choice- choices are based on advertising, but underneath the packaging, products are often very similar.
- Planned Obsolescence- designed to wear out soon
- Novelty- Developed societies have created a fifth need - fed by advertising- the need for novelty.
- more people= more resources required= more space = more deforestation
- Leads to hyper-consumption
- Cathedrals of consumption- casinos, shopping malls, theme parks
- Affluenza- The idea that if we are wealthy, we can buy everything we ever need.
- Green Guilt- emotional sentiment associated with consumption that is not environmentally aware.
- Slow Food Movement in opposition to Fast Food (Relocalisation)
- We lost connections to our natural environment.
- Cocooning- living within ourselves and interacting with people mainly through technology.
- Reconsider and Refuse vs. Recycle Reuse Reduce
- Carrying Capacity- living with ecological limits. Defines the number of individuals an environment can support without degrading a population's ecosystem.
- I=PAT

## Sustainable Development vs. Sustainability

- Not all about growth and progress but balance
- Blowers et al. (2012) suggest that "as it is conceived now and used at present sustainable development is not sustainable.
- Ecological footprint- a measure of human demand on Earth's ecosystems. Measures the rate at which resources are consumed by the human population and the rate at which waste is minimized by the environment.

## Key Terms:

- Three pillars of sustainability- promoting social justice, economic well-being, and environmental quality at the same time. Full-filling three goals simultaneously satisfy what is known as a triple bottom line. Issues such as poverty, unemployment, and inequality create tensions between these three pillars; therefore tradeoffs are needed to solve them.
- Personal responsibility- A sustainable future requires a shift towards a systems perspective with an emphasis on interdisciplinary understanding, collaboration, and co-operation. We need to take personal responsibility.

- Environmental ethics (ethical extensionism)- is an argument in environmental ethics that has moral standing ought to be extended to things that traditionally are not thought of as having moral standing. (animals, plants)
- Systems- A set of interrelated things that affect each other.
- Gaia theory- refers to the concept of the planet as a self-regulating system first developed by James Lovelock. Ex- Our Sun gets hotter as it ages, the average surface temperature on Earth has never varied by more than a few degrees.
- Ecosystem goods and services- Nature provides us with goods we rely on ex- water. We exploit the environment because no economic value is attached to them.
- High throughput, low throughput, and steady-state economies- High throughput economies- highly productive but produces more waste. Low throughput economies- highly productive but produces less waste. Steady state- An economy that mimics natural ecological systems by recycling used resources. It would have zero economic growth.
- Limits to growth- 1972 report on the computer simulation of exponential economic and population growth with a finite supply of resources.
- Neoclassical and ecological economies- neoclassical economists- alternatives are there for resources, unlimited growth. Ecological economist- scarce resources.
- External costs- an assumption that all the costs and benefits associated with an exchange of goods and services are borne by other individuals not involved in the transaction.
- Natural capital- is a way to estimate the value of the goods and services provided by nature. It is not measured in economics.
- Relocalisation - using local resources, ex- community gardens, or farmer's market.
- Carrying Capacity- living with ecological limits. Defines the number of individuals an environment can support without degrading a population's ecosystem.
- Ecological footprint- a measure of human demand on Earth's ecosystems. Measures the rate at which resources are consumed by the human population and the rate at which waste is minimized by the environment.

## Historical Perspectives of Sustainability

### The beginnings of sustainability

- Silent Spring 1962- Rachel Carson
- Our Common Future 1987- Brundtland Report
- Environmentalism- A political and ethical movement (involves activism) that seeks to improve and protect the natural environment.
- The history of sustainability is as much social, political, and economical as it is environmental. Caradonna, 2014
- Greece- cutting down trees to make ships which led to soil erosion (Plato)
- we are separate and dominant over nature. Rene Descartes wrote of how we might become "masters and possessors of nature."
- Specialization from excess food production, an agricultural revolution led to the use of more resources.

### The 1700s

- Subsistence living
- Heavily reliant on forestry, woodlands were used for a wide range of needs.
- For the elite- hunting and leisure
- Led to shrinking woodlands, Williams (2003) estimates that Europeans removed 25 million hectares of woodland between 1700 and 1850.
- Increase in price of timber with increasing demand
- Initially, concern for deforestation was linked with economic and social consequences
- Connections were eventually made between human activity and climate
- Scarcity and high prices caused suffering for the weakest members of society.

### The word sustainability

- "Nachhaltigkeit"- German equivalent to the word sustainability. It was used about the practice of harvesting timber continuously from the same forest.

### Japan

- Self-sufficient
- expanding economy and population
- Fire in 1657 burned half the capital killing 100000
- Coal alternative
- Top-down approaches to forest management practices